

# **MULTIMEDIA TIME WARPING SYSTEM**

## **ABSTRACT**

A multimedia time warping system. The invention allows the user to store  
5 selected television broadcast programs while the user is simultaneously watching  
or reviewing another program. A preferred embodiment of the invention accepts  
television (TV) input streams in a multitude of forms, for example, National  
Television Standards Committee (NTSC) or PAL broadcast, and digital forms  
such as Digital Satellite System (DSS), Digital Broadcast Services (DBS), or  
10 Advanced Television Standards Committee (ATSC). The TV streams are  
converted to an Moving Pictures Experts Group (MPEG) formatted stream for  
internal transfer and manipulation and are parsed and separated it into video and  
audio components. The components are stored in temporary buffers. Events  
are recorded that indicate the type of component that has been found, where it is  
located, and when it occurred. The program logic is notified that an event has  
occurred and the data is extracted from the buffers. The parser and event buffer  
decouple the CPU from having to parse the MPEG stream and from the real  
time nature of the data streams which allows for slower CPU and bus speeds  
and translate to lower system costs. The video and audio components are  
stored on a storage device and when the program is requested for display, the  
video and audio components are extracted from the storage device and  
reassembled into an MPEG stream which is sent to a decoder. The decoder  
converts the MPEG stream into TV output signals and delivers the TV output  
signals to a TV receiver. User control commands are accepted and sent through  
the system. These commands affect the flow of said MPEG stream and allow  
the user to view stored programs with at least the following functions: reverse,  
fast forward, play, pause, index, fast/slow reverse play, and fast/slow play.

15  
20  
25